

# Product Description Document

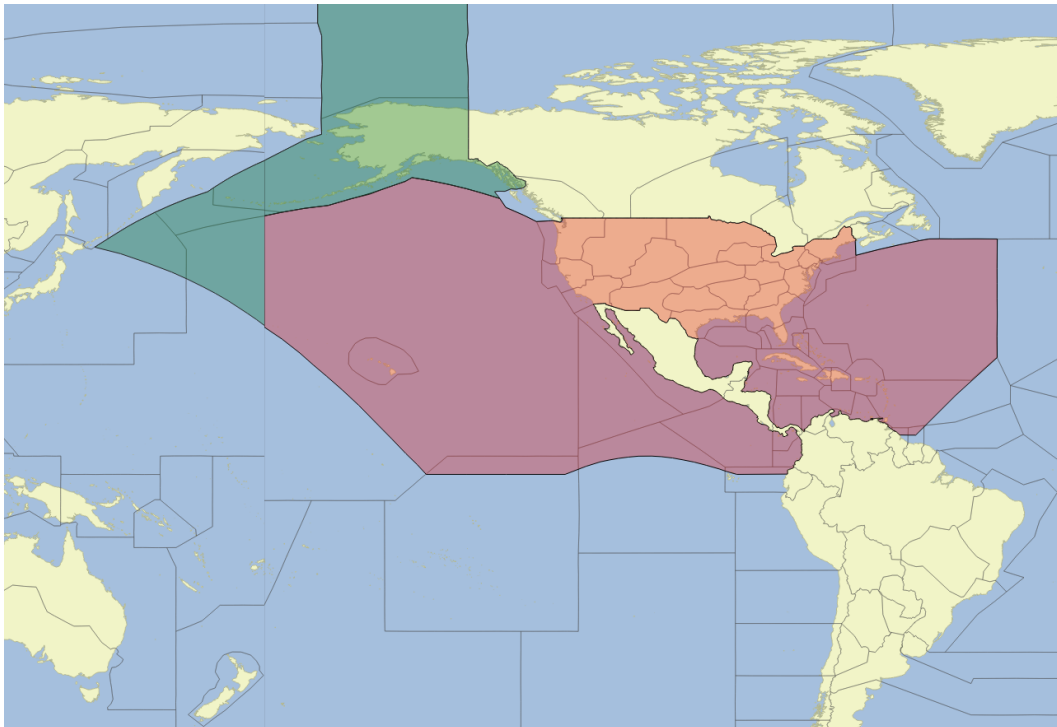
## Graphical Forecasts for Aviation

### Expansion over Alaska

Updated: January 2022

#### Part 1 – Mission Connection

- 1. Product Description:** The operational Graphical Forecasts for Aviation (GFA) are a set of web-based displays that provide observations and forecasts of weather phenomena critical for aviation safety. This product covers the conterminous United States (CONUS) and United States controlled airspace and Flight Information Regions (FIRs) for which the Aviation Weather Center (AWC) has current area forecast responsibilities. These FIRs cover the Gulf of Mexico, Caribbean, portions of the Atlantic Ocean, Hawaii and portions of the Pacific Ocean from Midway to coastal waters of Central and parts of South America from the surface up to Flight Level 480 (FL480) or approximately 48,000 ft. above Mean Sea Level (MSL). The expansion adds Alaska, the Bering Sea, the Chukchi Sea, and portions of the Arctic Ocean (see Fig. 1).



*Fig. 1. Domain of the current operational GFA depicting CONUS (orange fill), the Gulf of Mexico, Caribbean, portions of the Atlantic, Hawaii and portions of the Pacific Ocean from Midway to the Aleutians to the coastal waters of Central and northern South America (red fill). The expansion covers Alaska and surrounding waters (green fill).*

Wind, icing, and turbulence forecasts are available in 3,000 ft. increments from the surface up to FL180 (18,000 ft. MSL), and in 6,000 ft. increments from FL180 to FL480. Turbulence forecasts are also broken into LO (below FL180) and HI (FL180 and above) graphics. A maximum icing graphic and maximum wind velocity graphic (regardless of altitude) are also available.

Multiple fields of interest are combined in categories that the user can select from the top of the display. Data are time-synchronized and available hourly from the previous 14 hours to present (now) in the *Observations/Warnings* category, and from 1 to 15 hours in the future (+1 to +15 hours) in the *Forecasts* category. The data for each category is determined by the time period: Observations & Warnings (current time and the previous 14 hours) and Forecasts (valid up to 15 hours in the future). Details of each category are in the following table:

Category	Layer	Data Displayed
Observations & Warnings	Aerodrome routine Meteorological Reports (METARs)	Station Model METARs; Significant Meteorological Information (SIGMETs); all NWS Warnings impacting aviation; Satellite/Radar  (-14 hours to Now)
Observations & Warnings	Precipitation/Weather	Weather Symbols; Convective SIGMETs; tropical cyclone, tornado, severe thunderstorm, winter storm, freezing rain, ice, and lake effect snow warnings; Satellite/Radar  (-14 hours to Now)
Observations & Warnings	Ceiling (CIG)/ Visibility (VIS)	Flight Category (FLT CAT) symbol/number; Convective SIGMETs; tropical cyclone warnings; blowing dust, blowing sand and volcanic ash SIGMETs; winter storm, blizzard, blowing dust warnings; dense fog/freezing fog/marine dense fog advisories; Satellite/Radar  (-14 hours to Now with selector for FLT CAT, CIG, VIS)
Observations & Warnings	Pilot Reports (PIREPs)	PIREPs; all SIGMETs; Satellite/Radar  (-14 hours to Now with vertical slider)

Observations & Warnings	Radar/Satellite	Radar/Satellite; all SIGMETs; all NWS warnings impacting aviation  (-14 hours to Now)
Forecasts	Terminal Aerodrome Forecasts (TAFs)	Station Model TAFs; all SIGMETs; all NWS warnings impacting aviation  (+1 to +15 hours)
Forecasts	Ceiling/Visibility	Model derived FLT CAT; CIG & VIS with weather overlay including National Digital Forecast Database (NDFD) precipitation/ weather type/intensity; Instrument Flight Rules (IFR) Airmen's Meteorological Information (AIRMETs); Convective SIGMETs; tropical cyclone warnings; blowing dust, blowing sand, and volcanic ash SIGMETs; winter storm, blizzard, and blowing dust warnings; dense fog/freezing fog/marine dense fog advisories  (+1 to +15 hours with selector for FLT CAT, CIG, VIS)
Forecasts	Clouds	Model derived Clouds Coverage (COV), Bases (BASE), and Tops (TOPS); mountain obscuration AIRMETs; Convective SIGMETs; tropical cyclone warnings; volcanic ash SIGMETs  (+1 to +15 hours with selector for TOPS/COV/BASE)
Forecasts	Precipitation/Weather	NDFD or model derived Precipitation Type/Chance/Intensity; NDFD or model derived Weather; Convective SIGMETs; tropical cyclone warnings; volcanic ash SIGMETs; tornado, severe thunderstorm, winter storm, ice, freezing rain, and lake effect snow warnings  (+1 to +15 hours)

Forecasts	Thunderstorms	NDFD or model derived Thunderstorms Coverage/Type/Intensity; Convective SIGMETs; tropical cyclone warnings; tornado and severe thunderstorm warnings (+1 to +15 hours)
Forecasts	Winds	NDFD or model derived Wind Speed and Gust; low level wind shear and strong surface wind AIRMETs; Convective SIGMETs; tropical cyclone warnings; gale, high wind, lake wind, winter storm, blizzard, ice, storm, and blowing dust warnings (+1 to +15 hours; vertical slider)
Forecasts	Turbulence	Graphical Turbulence Guidance; turbulence AIRMETs; turbulence SIGMETs (+1 to +15 hours with vertical slider)
Forecasts	Ice	Forecast Icing Product (FIP); NDFD or model derived Winter Precipitation/Weather Type/Chance/Intensity; Icing AIRMETs; Icing SIGMETs; winter storm, blizzard, lake effect snow warnings; freezing fog advisories (+1 to +15 hours with vertical slider)

Some datasets such as NDFD, AIRMETs, radar, and NWS issued warnings are only available for US states and territories. AIRMETs are only available from the current time to between +6 and +12 hours. Where not available, NDFD is replaced with automated model guidance from the Rapid Update (RAP) model first, then the Global Forecast System (GFS) model if outside of the RAP domain. The best available model is used when NDFD is unavailable. Convective SIGMETs are only issued for the CONUS; however, SIGMETs for thunderstorms are available in non-CONUS locations.

Additional information is available in text format when mouse-clicking on the map or using the hover function. The “Map Options” menu enables the user to customize the display, including the base map selection, specific data displayed, and map opacity, scales, and density. Overlays include airports, heliports, runways, jet routes, airways, airspace, Air Route Traffic Control Center (ARTCC)/Flight Information Region (FIR) boundaries, Navigational Aids (NAVAIDs), aviation point fixes, highways, roads, counties, and rivers. More detail is also revealed as you zoom in and individual layers can be turned on or off independently.

In addition to the graphical display, static images will become available at a later date and will be displayed on Lambert-Conformal Conic projections. Once available, these images will be issued daily every three hours, beginning at 00 UTC, and will provide information on clouds, visibility, surface winds, precipitation, and weather as summarized in this table:

Static Image	Weather Grid	Weather Overlay
Clouds	RAP Cloud Coverage	Model derived Cloud Base, Layers, Tops
Visibility, Surface Winds, Precipitation, and Weather	Local Aviation Model Output Statistics (MOS) Program (LAMP) visibility	NDFD or model derived Wind Speed & Gusts; NDFD or model derived Precipitation/Weather Type/Intensity

**2. Purpose/Intended Use:** The GFA provides meteorological information in support of aviation. The expansion of the GFA to Alaska includes observations and forecasts valid for the Alaska Flight Information Regions critical for aviation safety overlaid on high-resolution maps.

The Alaska Aviation Weather Unit will continue to provide text Area Forecasts (FA) for Alaska to support Alaskan users. Both products may be used for planning purposes.

The FAA, pursuant to Title 49 United States Code Section 44720, established requirements for this weather information and service which is necessary for the safe and efficient conduct of operations in the National Airspace System (NAS).

**3. Audience/Users:** Commercial and general aviation pilots, operators, briefers, and dispatchers.

**4. Presentation Format:** The GFA contains multiple displays of weather phenomena combined in a single interactive online domain, with the additional option to view static imagery. Overlays include airports, heliports, runways, jet routes, airways, airspace, ARTCC/FIR boundaries, NAVAIDs, aviation point fixes, highways, roads, counties, and rivers.

**5. Feedback Method/Period:** For further information or to provide feedback, please contact:

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Kansas City, MO  
816-584-7281  
[Jennifer.Stroozas@noaa.gov](mailto:Jennifer.Stroozas@noaa.gov)

## **Part 2 – Technical Description**

**1. Format and Science Basis:** The GFA combines OpenLayers displays of multiple weather parameters on a single webpage, with the additional option to view static imagery. The graphical display itself is not a weather product; it is a repository that aggregates a number of existing weather products into a single, quick-glance, automated display. These various graphics are overlaid on high-resolution base-maps and can be selected from the “Map Options” menu. The OpenLayers environment also offers more core functionality and support for mobile devices.

**2. Training:** A tutorial is available at <https://AviationWeather.gov/gfa/help?page=tutorial>

**3. Availability:** The GFA expansion to Alaska is available at <https://AviationWeather.gov/gfa>.